Remarks/Arguments

Reconsideration of this application is requested.

Correction of Filing Date

This application was filed on June 23, 2000, as indicated by the initial filing receipt in this application. At some point PTO records were erroneously changed to indicate a filing date of November 20, 2000. A petition to correct this error has been separately submitted to the Petitions Branch (copy enclosed).

Claim Status

Claims 1-4 were previously presented and remain pending. Claim 1 is amended.

Claim Rejections – 35 USC 103(a)

Claims 1-3 are rejected under 35 USC 103(a) as obvious over Sakemi et al. (USP 5,890,283). Claims 1-4 are rejected as obvious over Nakazato (USP 5,768,775). In response, independent claim 1 is amended to clearly distinguish over Sakemi and Nakazato.

Claim 1 is amended to recite:

> ...an energized force generating device for lifting said head in an upward direction by a power that is larger than the weight of said head...
>
> and
>
> ...the clamping device is configured to clamp the head against the lower positioning stop with a sufficiently strong force that is larger than the head's upward force to prevent vibration of the head during movement of the head...

Thus, as discussed extensively throughout applicant's specification, a clamping force greater than the head's upward force is applied to prevent vibration during movement, and a lifting force greater than the weight of the head is applied to lift the head. With this configuration, the need to change over spring 16 every

time head 4 is changed (to a head with a different weight) is eliminated. Rather, the pressure applied by cylinder 15 may simply be adjusted.

During movement of the head, Sakemi and Nakazato disclose only that the force of spring 40 is equal to the weight of the case 31 and attracting tool 32 (Sakemi, col. 4, lines 31-33; Nakazato, col. 2, lines 57-59). Thus, when case 31 and attracting tool 32 are changed and have a new weight, spring 40 must also be changed to accommodate the new weight, so that the spring 40 will continue to counterbalance case 31 and attracting tool 32 during movement of the head.

The present invention eliminates this need to choose a spring matched to weight, since a clamping force greater than the head's upward force is always applied to prevent vibration during movement. Even if the head is made heavier or lighter, spring 16 need not be changed.

In reference to previous arguments submitted with respect to touch sensor 43 of Sakemi and Nakazato, applicant notes that it is the absence of such a clamping force during movement in Sakemi and Nakazato that allows sensor 43 to be used as a positional standard. Nakazato's cylinder 38 is disclosed only as a pressing means for suction tool 32 for pushing the solder balls 1 to the electrode with a force of adequate magnitude not to sink or crush the solder balls 1 into the suction holes 35 (Nakazato, column 4, line 3-11). Such a weak force may not damage sensor 43. The present invention, conversely, applies a clamp power with a strong force to prevent vibration of the head during movement. There is no such disclosure in Sakemi and Nakazato. Rather, during movement of the head, Sakemi and Nakazato disclose merely that the spring force equals and is counterbalanced by the weight of the head (case 31 and attracting tool 32). The head will stagger and vibrate under the configuration of Sakemi/Nakazato.

Conclusion

This application is now believed to be in condition for allowance. The Examiner is invited to telephone the undersigned to resolve any issues that remain

after entry of this amendment. Any fees due with this response may be charged to our Deposit Account No. 50-1314.

Respectfully submitted,
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